

REVISION OF
THE FLORA OF THE BOMBAY PRESIDENCY.

BY

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PART XXI.

(With 2 plates).

(Continued from page 320 of this volume.)

ASCLEPIADACEAE.

BY

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ASCLEPIADACEAE, (Cke. ii, 144).

Genera 300. Species 1,700.—Mostly tropical, chiefly Africa, a few in temperate regions.

Cooke gives 25 genera. We have added *Cryptostegia*, *Asclepias* and *Orthanthera*; *Dacmia* has been changed into *Pergularia*, and *Pergularia* into *Telosma*.

1. HEMIDESMUS R. Br.

Species 1.—India.

1. **Hemidesmus indicus** R. Br. in Mem. Wern. Soc. 1 (1811) 57; Grah. Cat. Bomb. Pl. (1839) 122; Dalz. & Gibs. Bomb. Fl. (1861) 147; Wight Ic. t. 594; Cke. ii, 146.—*Asclepias pseudo-sarsa* Roxb. Hort. Beng. (1814) 20; Fl. Ind. ii (1832) 39 (*excl. syn.*).—Rheede Hort. Mal. x, t. 34.

Description: Cke. ii, 146.

Locality: *Khandesh*: W. Khandesh (Blatter & Hallberg ?).—*Konkan*: Common in Salsette (McCann ?); Bombay Island (Blatter ?).—*W. Ghats*: Khandala (Blatter ?); Pasarni Ghat (Blatter & Hallberg B1630 ?); Purandhar (Blatter & McCann ?).—*Deccan*: Poona (Blatter ?).—*S. M. Country*: Belgaum (Ritchie); Castle Rock (Bhiva ?).—Very common throughout the Presidency, especially in hedges.

Distribution: Waziristan, N. India from Banda to Oudh, Sikkim, southwards to Travancore and Ceylon.

2. CRYPTOLEPIS R. Br.

Species 20.—Palaeotropics.

1. **Cryptolepis Buchanani** Roem. & Schult. Syst. iv (1819) 409; Dalz. & Gibs. Bomb. Fl. (1861) 148; Wight Ic. t. 494; Talbot For. Fl. Bomb. ii (1911) 236; Cke. ii, 147.—*C. reticulata* Wall. Cat. 1640; Royle III. 270.—*Nerium reticulatum* Roxb. Hort. Beng. (1814) 19; Fl. Ind. ii (1832) 8.—*Echites reticulata* Roth. Nov. Sp. (1821) 134.—Rheede Hort. Mal. ix, t. 11.

Description: Cke. ii, 148.

Locality: *Konkan*: Elephanta (Dalzell & Gibson); Karanja (Blatter ?).—*W. Ghats*: Khandala (Blatter ?); Panchgani (Hallberg ?).—*Deccan*: Near Poona (Bhiva).—*S. M. Country*: Belgaum (Cooke ?).—*N. Kanara*: (Kanara ?).

Flowers: At the beginning of and during the rains. According to Talbot throughout the year.

Distribution: Throughout India, Ceylon, Burma, China.

3. CRYPTOSTEGIA R. Br.

Lofty climbers. Leaves opposite. Flowers large, in terminal 3-ctotomous cymes. Sepals lanceolate. Corolla funnel-shaped, tube short, throat campanulate; lobes broad, overlapping and twisted to the right. Coronal scales at the base of the throat, subulate, entire or 2-cleft. Filaments short; anthers adnate to the stigma, acute; pollen-masses in pairs in each cell, granular, appendages

subspathulate. Stigma convex. Follicles thick, divaricate, hard, 3-winged, furrowed between the wings. Seeds comose.

Species 2.—Tropical Africa, Madagascar.

The following species has been introduced into India and is found as an escape in many parts.

1. **Cryptostegia grandiflora** R. Br. in Bot. Reg. (1819) t. 435; Wight Ic. t. 832 and Ill. ii, t. 182, f. 9; Bull. 104 Dept. Agric. Bombay p. 7.

Description: A large evergreen glabrous woody climber, stems up to 15 cm. diam., bark grey, juice copious milky. Leaves opposite, 5-10 by 3.8-5 cm., elliptic, usually abruptly narrowed at both ends, coriaceous, glossy above green beneath, lateral nerves numerous slender arched; petiole 7.5-13 mm. long, the bases of opposite pairs of petioles joined by a slightly raised line. Flowers about 5 cm. across, pinkish purple, in terminal di- or trichotomous, few-flowered cymes. Peduncle and pedicels stout, hoary or glabrous; bracts caducous. Calyx glabrous or hoary, cleft nearly to the base, lobes ovate-lanceolate, acute, with numerous glands at the base. Corolla funnel-shaped over 5 cm. long, shortly tubular below, throat campanulate; lobes broad, acute, overlapping to the right in bud, glabrous. Corona of 5 scales inserted at the base of the throat, each scale cleft into two, long, subulate segments. Stamens with short filaments, anthers adnate to the stigma, connectives produced into acute processes connivent over the stigma; pollen-masses granular, in pairs in each cell. Ovary half-inferior; stigma convex. Follicles 10-12.5 cm. long by 2.5 cm. broad near the base, woody, angled or winged, divaricate. Seeds 7.5 mm. long, oblong, compressed; coma 3.8 cm. long. (Ex Parker.)

Locality: Grown extensively in gardens in the Bombay Presidency. Also found as an escape.

Distribution: A native of Madagascar. Naturalized in many parts of India.

Uses: See Troup, *Silvicult. of Ind. Trees* ii, 673.

4. PERIPLUCA TOURN. ex Linn.

Species 12.—Temperate regions of Old World, tropical Africa.

1. **Periploca aphylla** Decne. in Jacquem. Voy. Bot. (1844) 109, t. 116; Cke. ii, 148.

Locality: *Sind*: Tatta (Blatter & McCann D337 ! D539 !); Soorjana hill, 1,800 ft. (Ticehurst 30874 !); Thano-Bula-Khan (Woodrow).

Distribution: Punjab, Sind, Baluchistan, Waziristan.—Afghanistan, Persia, Arabia, Egypt.

5. TOXOCARPUS WIGHT & ARN. (Cke. ii, 148).

Species 22.—Palaeotropics.

1. **Toxicarpus Kleinii** Wight & Arn. in Wight Contrib. (1834) 61; Wight Ic. t. 886.—*T. concanensis* Hook. f. F.B.I. iv (1883) 14.

We have united *T. concanensis* with *T. Kleinii*. Cooke ii, 149 says that except in the size of the leaves, *T. concanensis* does not seem to differ from *T. Kleinii*. Everybody knows how variable the leaves are in the *Asclepiadaceae*. Gamble does not mention the species in his Flora of Madras (p. 830).

Locality: Only found in the Konkan.

Distribution: Konkan of the Bombay Pres. Bababudan hills of Mysore. Kanara is very doubtful.

6. GENIANTHUS HOOK. f. (Cke. ii, 149).

Species 4.—Indo-Malaya.

1. **Genianthus laurifolius** Hook. f. F.B.I. iv (1883) 16.—*Toxicarpus laurifolius* Wight Contrib. 61, Ic. t. 598.—*Asclepias laurifolia* Roxb. Fl. Ind. ii (1832) 49.

Locality: Konkan and N. Kanara.

Distribution: Sikkim Himalaya in hot valleys, Chittagong to Pegu, S. Kanara.

7. GLOSSONEMA Decne. (Cke. ii, 150).

Species 6.—Tropical Africa and Asia.

1. **Glossonema varians** Benth. in Benth. & Hook. f. Gen. Pl. ii (1876) 748; Cke. ii, 150.—*Mastostigma varians* Stocks in Hook. Ic. Pl. 9 (1852) t. 863.

Description: Cke. l.c.

Locality: *Sind*: Jemadar ka Landa, near Karachi (Stocks 467); stony ground, Karachi (Stocks 64).

Distribution: *Sind*, Waziristan, W. Rajputana.—Baluchistan, Persia.

8. CALOTROPIS R. Br. (Cke. ii, 151).

Species 3.—Tropical Asia and Africa.

See: Berteau, A.—Les Calotropis. L'Agric. prat. des pays chauds xii, S. 1, p. 102-109, 224-234, 324-333, 417-428, 467-475; S. 2, p. 63-73, 133-143 (1912). These articles give all the information about our 2 species, botanical, geographical and economical.

1. **Calotropis gigantea** R. Br. in Ait. Hort. Kew ed. 2, ii (1811) 78; Cke. ii, 151.

Description: Cke. l.c.

Locality: *Gujarat*: (Sedgwick !); Ahmedabad (McCann !); along B. B. & C. I. Ry. throughout (McCann !).—*Konkan*: Bombay Island (McCann !); Salsette (McCann !); Uran (Blatter !); Pen (McCann !).—*W. Ghats*: Khandala (Blatter & McCann !); Lonavla (McCann !); Panchgani (Blatter !).—*Deccan*: Poona (Blatter !), along road from Poona to Wai (McCann !).—*S. M. Country*: Belgaum Dist. (Talbot), along M. & S. M. Ry. (McCann !).—*N. Kanara*: Kala Nuddi (Ritchie 424).—A common weed in waste places.

Distribution: Throughout India, Ceylon, Malay Islands, S. China.

'Owing to the silky coma the seeds are carried to a considerable distance by the wind, and the plants spring up readily on open ground and waste places.' (Troup).

2. **Calotropis procera** R. Br. in Ait. Hort. Kew. ed. 2, ii (1811) 78; Wight Ic. t. 1278; Cke. ii, 152.

Description: Cke. l.c.

Locality: *Sind*: Karachi, Magho Pir (Sabnis B223 !), Clifton sands (Sabnis B807 !), Manora Island (Sabnis B828 !); Larkana (Sabnis B90 !, B481 !), Schwan, Kalar soil (Sabnis B589 !), Laki hill (Sabnis B13 !, B128 !); Khairpur, Mirva canal banks (Sabnis B270 !); Nawabshah, Pad Idan (Sabnis B505 !); Hyderabad, Phuleli canal banks (Sabnis B202 !), Ganja hills (Sabnis B1005 !); Thar and Parkar, Nasarpur (Sabnis B1123 !), Jamesabad (Sabnis B969 ! B1102 !), Sanghar (Sabnis B626 !), Umarkot, sandy plains (Sabnis B1089 !); Mirpur Sakro (Blatter & McCann !).—*Cutch*: Very common (Blatter !).—*Kathiawar*: Common (Blatter !).—*Gujarat*: Abundant (Sedgwick).—*Khandesh*: Along Tapti (Blatter & Hallberg !).—*Deccan*: Poona (Cooke !).—*S. M. Country*: Common in the dry parts of Belgaum Dist. (Talbot).

Flowers: Throughout the year.

Distribution: More or less in warm dry places throughout India, Waziristan, Afghanistan, Arabia, Egypt, tropical Africa.

'Springs up in abundance on new sandy or gravelly alluvium in the beds of rivers and is a common forerunner of riverain forests of *Acacia catechu* and *Dalbergia sissoo*.' (Troup).

9. OXYSTELMA R. Br. (Cke. ii, 152).

Species 10.—Tropical and subtropical regions.

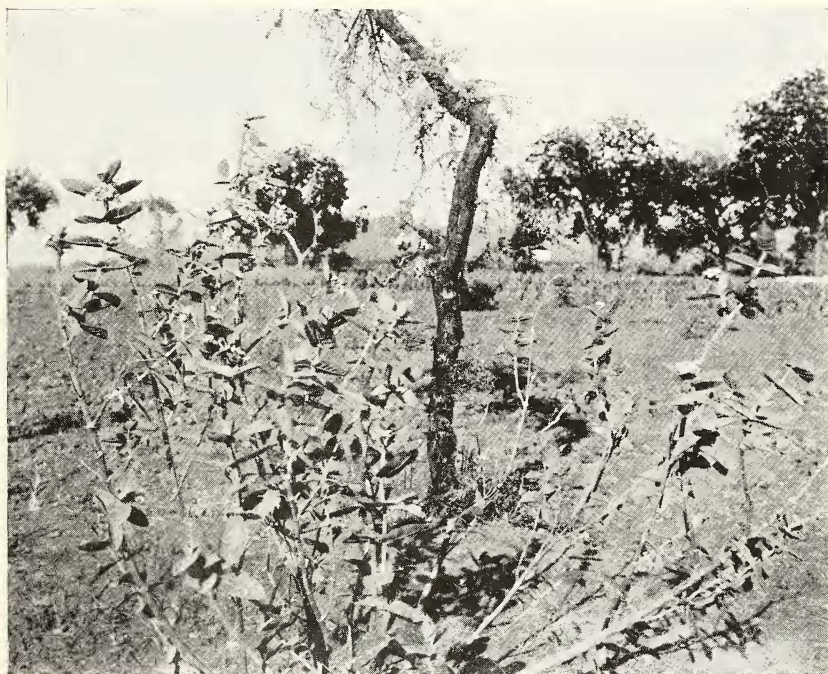
1. **Oxystelma esculentum** R. Br. in Mem. Wern. Soc. i (1811) 40; Cke. ii, 152.—*Periptoca esculenta* Linn. f. Suppl. 168; Roxb. Corom. Pl. i, 13, t. 11.

Description: Cke. l.c.

Locality: *Sind*: Laki (Sabnis B64 !); Mirpur Sakro (Blatter & McCann D59 ! D63 ! D64 !); Gulam, limestone hills (Blatter & McCann D60 !), Bughar River (Blatter & McCann D58 !).—*Cutch*: (Blatter !).—*Gujarat*: Edges of stream, Watrak and Meshwa Rivers (Sedgwick !).—*Konkan*: Bombay (Hallberg !); Matunga (Hallberg !); Salsette (Hallberg !); Uran (Blatter !).—*Deccan*: Poona (Blatter !); river-bank near the Sangam (Cooke !).—*S. M. Country*: Belgaum (Ritchie).—*N. Kanara* (Law).



Flowers of *Calotropis procera* R. Br.



Bush of *Calotropis procera* R. Br.

Photos by C. McCann.

Distribution: Plains and lower hills of India, usually near water (W. Rajputana), from the Punjab to Ceylon, Assam, Pegu and Tenasserim, Ava, Java.

Var. Wallichii T. Cooke, Fl. Bomb. ii, 153.—*Oxystelma Wallichii* Wight Contrib. (1834) 54; DC. Prodr. viii (1844) 543.—We drop this variety as Cooke himself admits that in his opinion the question cannot 'be ever satisfactorily settled'. Gamble Fl. Madras 833, does not mention Wight's species.

10. ASCLEPIAS Linn.

Perennial erect herbs. Leaves opposite, alternate or whorled. Cymes umbelliform; flowers medium-sized or small. Sepals glandular within. Corolla rotate, lobes often reflexed, naked, valvate. Coronal-scales 5, erect, adnate to the column, spoon-shaped. Anther-tips membranous, inflexed; pollen-masses one in each cell, pendulous, flattened, waxy. Stigma depressed, 5-angled. Follicles turgid, beaked, smooth. Seeds comose.

Species 160.—America, Africa, especially United States.

1. *Asclepias curassavica* Linn. Sp. Pl. (1753) 215; Graham Cat. (1839) 120; Dalz. & Gibs. Bomb. Fl. Suppl. 54; Bot. Reg. t. 81.

Popular name: Bastard or Wild Ipecacuanha, Blood flower.

Description: An erect undershrub 0.9-1.2 m. high. Leaves opposite, 7.5-10 by 1.3-2.5 cm., lanceolate, thin, membranous, narrowed at both ends; petiole 5 mm. long. Flowers 7.5 mm. across, orange, in axillary umbels; peduncle 2.5 cm. long; pedicels 1.8 cm. long. Calyx 2.5 mm. long, cleft to the base, lobes oblong-lanceolate. Corolla 6 mm. long, lobes reflexed in flower, valvate in bud. Corona bright orange, of 5 erect processes adnate to the stipe of the staminal column. Staminal column distinctly stipitate, anthers with membranous inflexed tips; pollen-masses solitary in each cell, pendulous, flattened, waxy. Follicles solitary, erect, 7.5 cm. by 7.5-10 mm., straight, tapering at both ends, pericarp thin. Seed ovoid, 5 mm. long, dark brown; coma 3 cm. long.

Locality: Extensively grown in gardens, now naturalized and run wild in many places. Very abundant in the fields near the railway station at Poona; found also at Gulam (Indus Delta) in a garden (Blatter & McCann D569 !).

Distribution: A native of the West Indies, introduced into the tropics.

11. PENTATROPIS (R. Br.?) Wight & Arn.

Species 8.—Palaeotropics.

Cooke gives 2 species: *P. cynanchoides* R. Br. and *P. microphylla* Wight & Arn. The former has to cede to *P. spiralis* Decne.

1. *Pentatropis spiralis* Decne. in Ann. Sc. Nat. sér. 2, ix (1838) 327, t. 11; Boiss. Fl. Or. iv, 58; Hook. f. F.B.I. iv, 19.—*Asclepias spiralis* Forsk. Fl. Aeg.—Arab. (1775) 49.—*Pentatropis cynanchoides* R. Br. in Salt Voy. Abyss. (1814) Append. 64; N. E. Brown in Dyer Fl. Trop. Afr. iv, 380; Cke. ii, 154.

The specific name *spiralis* is the oldest (1775). Besides there is some doubt as to whether the plant referred to by R. Brown is a *Pentatropis*. See Schumann in Engler and Prantl Pflanzenfamilien iv, 2, 258.

Locality: *Sind*: Larkana, Sehwan, sand dunes (Sabnis B668 !); Hyderabad, Ganja hill (Sabnis B394 !); Thar and Parkar, Mirpurkhas, watercourse (Sabnis B1029 ! B1041 !), Jamesabad, watercourse (Sabnis B973 !), Sanghar (Sabnis B624 !); Gharo (Blatter & McCann D47 ! D50 ! D51 !); Mirpur Sakro (Blatter & McCann D49 ! D52 ! D61 ! D62 !); Kulan Kote Lake (Blatter & McCann D48 !); Tatta (Blatter & McCann D17 !).

Distribution: Punjab, eastwards to the Jumna River, W. Rajputana, Baluchistan, Waziristan, Afghanistan, Arabia, tropical Africa.

2. *Pentatropis microphylla* Wight & Arn. Contrib. (1834) 52; Wight l.c. t. 252; Decne. in DC. viii, 536; Hook. f. F.B.I. iv, 20; Cke. ii, 154.—*Asclepias microphylla* Roxb. Hort. Beng. (1814) 85; Fl. Ind. ii (1832) 35.—*Cynanchum acuminatum* Thurb. Obs. in Cynanchum (1821) 5.

Description: Cke. ii, 154.

Locality: *Cutch*: Very common (Blatter).—*Gujarat*: Common on laterite plateau, Talod (Sedgwick !), less common elsewhere (Sedgwick !); Dangs

(Bhiva).—*Konkan*: Malabar Hill, Bombay (Graham).—*Deccan*: Bijapur (Bhiva).—*S. M. Country*: Gokak (Bhiva).

Distribution: Waziristan, India (Bengal, Pegu, E. & W. Peninsula, Deccan), Ceylon.

12. PERGULARIA L. (*non aliorum auctorum*).

Twining pubescent or tomentose undershrubs. Leaves opposite, cordate. Flowers medium-sized, greenish white, in axillary racemose or corymbose pedunculate cymes; pedicels slender. Calyx 5-partite, 5-glandular, lobes acute. Corolla-tube short, campanulate or funnel-shaped; lobes 5, ovate, spreading, overlapping to the right in bud; corona double, the outer membranous, annular, 5-lobed, the lobes truncate or dentate, the inner of 5 erect, laterally compressed, lobes spurred at the base and produced above in long free often fimbriate tips curved over the style-apex. Stamens 5, adnate to the corolla-tube; filaments connate in a column; anther-appendages membranous, inflexed; pollen-masses waxy; pendulous, attached in pairs to the shining horny pollen-carriers without caudicles. Ovary of 2 distinct carpels; styles slender; style-apex slightly convex at top. Fruit of 2 lanceolate, acuminate, smooth or softly echinate, often recurved follicles. Seeds ovate, minutely pubescent, margined, ending in a silky white coma; cotyledons suborbicular, radicle pointed.

Species 15.—Africa, tropical Asia.

According to N. E. Brown (Kew Bull. 1917, 323) the genus *Pergularia* as established by Linnaeus (Mantissa i, 8) has hitherto been misunderstood. Now it has become clear that 'Linnaeus has very accurately and unmistakably described the generic structure of the plants on which Robert Brown afterwards founded the genus *Doemia* (usually but incorrectly written *Daemia*).'

For this reason the species given by Cke. ii, 155 as '*Daemia extensa*' must be transferred to *Pergularia* and as the specific name *daemia* by Forskal is older, the plant must be called *Pergularia Daemia*. The same applies to '*Daemia cordata*' now *P. tomentosa* which was found by Sabnis in Sind.

1. ***Pergularia Daemia*** Blatter & McCann *nov. comb.*—*Asclepias Daemia* Forsk. Fl. Aeg.—Arab (1775) 51.—*Pergularia extensa* N. E. Br. in Dyer Fl. Cap. iv, i, 758; Gamble Fl. Madras 837; Haines Bot. Bih. & Or. (1922) 552.—*Doemia extensa* R. Br. in Mem. Wern. Soc. i (1811) 50; Wight Contrib. (1834) 59; Ic. t. 596; Hook. f. F.B.I. iv, 21; Cke. ii, 155, Parker For. Fl. Punjab (1918) 342.—*Cynanchum extensum* Ait. Hort. Kew, ed. 1 (1789) 85; Jacq. Ic. Rar. t. 54.—*C. cordifolium* Retz. Obs. (1781) 15.—*C. echinatum* Thunb. in Cynanch. (1821) 8.—*Asclepias echinata* Roxb. Hort. Beng. (1814) 20.—*Raphistemma ciliatum* Hook. f. in Bot. Mag. t. 5704.—*Daemia Forskalii* Schult. Syst. vi, 113.

Description: Cke. ii, 155.

Locality: *Sind*: Gholam (Blatter & McCann D57 !), limestone hill (Blatter & McCann D56 ! D568 !); Tatta (Blatter & McCann D54 ! D55 !); Tatta Tombs (Blatter & McCann D53 !).—*Cutch*: Very common (Blatter !).—*Gujarat*: Common in hedges (Sedgwick); Palanpur State (McCann !).—*Khandesh*: Along Tapti River (Blatter & Hallberg !).—*Konkan*: Bombay, common (Hallberg !).—*Deccan*: Surwal (McCann !); Poona (Woodrow !); Wai (McCann !).—*S. M. Country*: Belgaum (Ritchie); Dharwar (McCann !).

Distribution: Throughout India in the drier regions, Rajputana, Ceylon.—Afghanistan, Arabia, tropical and S. Africa, Madagascar.

2. ***Pergularia tomentosa*** Linn. Mant. (1777) 53; Desf. Fl. Atl. 1, 209; Lam. Ill. t. 176.—*Daemia tomentosa* (Linn.) Vatke in Oester. Bot. Zeitschr. (1876) 146.—*D. tomentosa* Pomel Nouv. Mat. Fl. Atl. 82; Muschler Verh. Bot. Ver. Prov. Brandb. xlix (1907) 114.—*D. cordata* R. Br. in Mem. Wern. Soc. Edinb. i, 50; Boiss. Fl. Or. iv, 59.—*Asclepias cordata* Forsk. Fl. Aeg.—Arab. (1775) 49.—*Daemia incana* Decnè. in Ann. Sc. Nat. 2, sér. ix, 336.

Description: Stems shortly tomentose, with or without a mixture of long hairs, sometimes slightly hispid. Leaves deflexed; petiole 4-6 mm. long; blade 1-2.25 cm. long, 10 mm. to 2.5-3 cm. broad, cordate-orbicular or cordate-ovate, apiculate or shortly cuspidate, rather thick, tomentose on both sides. Flowers in a corymb-like raceme, which (including the peduncle) is 2-5 cm. long, tomentose or shortly and softly hairy, as are also the 0.8-2.5 cm. long pedicels, and the 2-5 mm. long ovate acute sepals. Corolla-tube 2.5-5 mm.

long; lobes 6-6.5 mm. long, oblong-ovate, acute, bearded along the margins. Outer coronal-lobes 1 mm. long, subquadrate or oblong, obtuse, truncate or denticulate; inner coronal-lobes 5.5-8 mm. long, fleshy, white, lanceolate, attenuate into subulate entire or bifid points, rising much above the staminal column and incurved over it, and with an acute spur about 2 mm. long, arising below the middle (1-1.75 mm. above the base) of the staminal column. Follicles 2.5-5.5 cm. long, ovoid, acuminate into a beak, more or less echinate, sometimes nearly smooth, minutely tomentose. Seeds 8 mm. long, 5 mm. broad, nearly flat, ovate, margined, minutely tomentose on both sides.

Locality: *Sind*: Laki hill (Sabnis B242 ! B282 !, Ticehurst 28219 ! St. X. C.).

Distribution: N. Africa, Nubia, Egypt, Arabia, Syria, Persia, Baluchistan.

13. HOLOSTEMMA R. Br. (Cke. ii, 156).

Species 3.—Indo-Malaya, China.

Cooke has one species: *H. Rheedianum* Spreng. which has to be changed into *H. annulare* K. Schum. *H. Rheedianum* Spreng. is an erect plant with oblong cuspidate strongly nerved leaves, and therefore very different from *H. Rheedei* Wall. But this name cannot be retained as *Asclepias annularis* Roxb. is older.

1. **Holostemma annulare** K. Schum. in Engl. & Prantl Nat. Pflanzenf. iv, 2 (1895) 250; Gamble Fl. Madras 834.—*H. Rheedei* Wall. Cat. (1828) 4469; Wight Contrib. 55, Ic. t. 597 (*corona non recte depicta tamquam surgens e corolla*).—*Asclepias annularis* Roxb. Hort. Beng. (1814) 20; Fl. Ind. ii (1832) 37.—*Sarcostemma annulare* Roth Nov. Sp. (1821) 178.—*Rheede* Hort. Mal. ix, t. 7.—*Holostemma Rheedianum* Cke. ii, 156 (*non* Spreng.).

Description: Cke. ii, 156.

Locality: *Konkan*: Sion (Blatter !); Malabar Hill (Blatter !); Salsette (Blatter !); Neral (Bhiva).—*Deccan*: Kothrud near Poona (Kanitkar); Bowdhan (Cooke).—*N. Kanara*: In moist forests (*ex* Talbot).

Distribution: Tropical Himalaya, Pegu, Burma, W. Peninsula, Ceylon, China.

14. CYNANCHUM Linn. (Cke. ii, 157).

Species 120.—Tropical and temperate regions.

Cooke gives 2 species: *C. Callialata* and *C. pauciflorum*. The latter has to be changed into *C. tunicatum*.

1. **Cynanchum Callialata** Ham. in Wight Contrib. (1834) 56; Wight Ic. t. 1279.

Locality: Add: *W. Ghats*: Lonavla (Blatter !).

2. **Cynanchum tunicatum** (Retz.) Alston in Kew Bull. (1932) 60.—*Periploca tunicata* Retz. Obs. ii (1781) 15.—*Asclepias tunicata* Roxb. Hort. Beng. (1814) 20; Fl. Ind. ii (1832) 35.—*Cynanchum pauciflorum* R. Br. in Mem. Wern. (Soc. i (1811) 45; Wight Contrib. (1834) 56; Ic. t. 354; Cke. ii, 157.—*Cynoactonum pauciflorum* Decne. in DC. Prodr. viii, 528.

Description: Cke. ii, 158.

Flowers greenish tinged with pink.

Locality: *Konkan* (*ex* Talbot), *Deccan*, S. M. Country, *N. Kanara*.

Distribution: Carnatic, E. slopes of W. Ghats, from the Pulneys southwards, Ceylon.

15. SARCOSTEMMA R. Br. (Cke. ii, 158).

Species 12.—Tropical and subtropical regions.

Cooke has 3 species. *Sarcostemma brevistigma* will be changed into *S. acidum*.

1. **Sarcostemma acidum** Voigt Hort. Sub. Calcutta (1845) 542.—*Asclepias acida* Roxb. Hort. Beng. (1814) 20; Fl. Ind. ii, 31.—*Sarcostemma brevistigma* Wight & Arn. in Wight Contrib. (1834) 59; Ic. t. 595; Jacq. Voy. Bot. 107, t. 113; Hook. f. F.B.I. iv, 26; Cke. ii, 158.

Description: Cke. ii, 158.

Locality: Sind: Umarkot, sandy plains (Sabnis B1074 !).—*Cutch*: Common in stony places (Blatter !).—*Konkan* (Stocks).—*Deccan*: In stony places (Talbot); Poona (Cooke).—*S. M. Country*: Belgaum (Ritchie 1864).

Distribution: Bengal, Burma, Deccan, Carnatic, W. Peninsula.

2. *Sarcostemma Stocksii* Hook. f. F.B.I. iv (1883) 27; Cke. ii, 159.—*S. brachystigma* (per errorem pro *brevistigma*) Hook. Ic. t. 861 (*florum umbellae axillares non recte delineatae*).

Locality: Sind: Gholam, limestone hill (Blatter & McCann D523 !); (Stocks 509).—*S. M. Country*: Dharwar Dist. (Talbot).

Distribution: So far endemic in the Presidency.

3. *Sarcostemma intermedium* Decne. in DC. Prodr. 8 (1844) 538; Wight Ic. t. 1281; Cke. ii, 159.—*S. viminale* Wight Contrib. 59 (*non R. Br.*).

Locality: Add: W. Ghats: Pasarni Ghat (Fernandez !); Katraj Ghat (McCann !); Khandala Ghat, Satara Dist. (McCann !).—*S. M. Country*: Dharwar Dist. (ex Talbot).

Distribution: W. Deccan, Carnatic.

16. GYMNEMA R. Br.

Species 40.—W. Africa to Australia.

Of the 3 species given by Cooke we omit *Gymnema perguarioides* Wight & Gard, as it does not occur in the Presidency.

1. *Gymnema sylvestre* R. Br. in Mem. Wern. Soc. 1 (1811) 33; Cke. ii, 160.

Distribution: Central and W. Peninsula from the Konkan to Travancore, throughout the Bombay Presidency in monsoon forests, common in hedges in the Dharwar district, also at Mahabaleshwar and Panchgani, and near the coast of Karwar, Waziristan, Bundelkhand, Saharanpur, Bihar, N. Circars, Deccan and Carnatic in dry forests, up to about 2,000 ft. in the hills. Ceylon, tropical Africa.

Medicinal uses: See K. S. Mhaskar and J. F. Caius: A study of Medicinal Plants ii *Gymnema sylvestre* Br. In Indian Medic. Research Mem. no. 16 (1930) 1-49.

2. *Gymnema montanum* Hook. f. F.B.I. iv (1883) 31; Cke. ii, 161.

Distribution: Konkan of the Bombay Presidency, W. Ghats, Nilgiris and Anamalais at 4,000-7,000 ft.

17. TYLOPHORA R. Br.

Species 50.—Palaeotropics.

Cooke gives 5 species. *T. tenuis* will be changed into *T. tenuissima*.

1. *Tylophora fasciculata* Ham. in Wight Contrib. (1834) 50; Hook. f. F.B.I. iv, 40; Cke. ii, 162.

Distribution: Sub-Himalayan tract of Rohilkand, N. Oudh and Gorakhpur, eastwards to the Khasia hills, N. Circars, Deccan, Carnatic, Konkan and S. M. Country of Bombay Presidency.

2. *Tylophora tenuissima* (Roxb.) Wight & Arn. in Wight Contrib. (1834) 49; Wight Ic. t. 588.—*Asclepias tenuissima* Roxb. Hort. Beng. (1814) 20; Fl. Ind. ii (1832) 41.—*Tylophora tenuis* Blume Bijdr. (1826) 1062; Decne. in DC. Prodr. viii, 608; Hook. f. F.B.I. iv, 42; Cke. ii, 162.—*T. carnosa* Wall. in Wight Contrib. (1834) 49; Wight Ic. t. 351 (*non Dalz. & Gibs.*).—*Asclepias dichotoma* Rottl. in Wallich's Cat. 8200, B.C.

Distribution: Bombay Presidency (doubtful, see Cke. ii, 163).—Madras Presidency: W. Ghats, Palni hills and hills of Tinnevely up to 7,000 ft; W. Coast, along backwaters in Travancore, Bengal, Burma, Malay Peninsula, Ceylon, Java, Borneo.

3. *Tylophora rotundifolia* Ham. in Wight Contrib. (1834) 50; Hook. f. F.B.I. iv, 43; Cke. ii, 163.

Distribution: Sub-Himalayan tracts of Rohilkand and N. Oudh, Gorakhpur, Assam, Konkan, S. M. Country, Ganjam, Anamalais, W. Ghats at 5,000 ft. in Madras Presidency.

4. *Tylophora Dalzellii* Hook. f. F.B.I. iv (1883) 43; Cke. ii, 163.—*Tylophora cariosa* Dalz. & Gibs. Bomb. Fl. (1861) 150 (*non* Wight).

Locality: Add: *W. Ghats*: Lonavla (Blatter †).

Distribution: Konkan, W. Ghats of Bombay Presidency.—Endemic (Hook. f. mentions Malabar, but Gamble does not include it in his Fl. Madras).

5. *Tylophora asthmatica* Wight & Arn. in Wight Contrib. (1834) 51; Cke. ii, 164.

18. TELOSMA Coville.

Twining undershrubs. Leaves opposite, usually cordate, membranous. Flowers rather large, yellow or greenish, in axillary umbelliform cymes. Calyx 5-partite, minutely glandular within; lobes lanceolate. Corolla somewhat salver-shaped, the tube swollen below, sometimes constricted at the throat; lobes oblong or linear, overlapping to the right, spreading in flower; corona-processes adnate to the back of the staminal column, erect, free above and sometimes 2-lamellate. Staminal column arising from near the base of the corolla-tube; anthers with membranous tips; pollen-masses erect, waxy, attached to the pollen-carriers by short caudicles. Ovary of 2 carpels, style short; style-apex umbonate or capitate. Fruit of 2 lanceolate terete rather turgid follicular mericarps. Seeds ovate, concave, ending in a silky coma.

Cooke mentions 2 species under *Pergularia*, both of which have to be transferred to *Telosma*.

1. *Telosma pallida* (Roxb.) Craib in Kew Bull. (1911) 418; Gamble Fl. Madras 844.—*Pergularia pallida* Wight & Arn. in Wight Contrib. (1834) 42; Wight Ic. t. 585; Hook. f. F.B.I. iv, 38; Cke. ii, 164.—*Asclepias pallida* Roxb. Hort. Beng. (1814) 20; Fl. Ind. ii (1832) 48.

Description: Cke. ii, 164 (under *Pergularia*).

Distribution: Tropical Himalaya, from Murree up to 5,000 ft. eastwards to Sikkin, Central India, Bihar, Burma, N. Circars, Hyderabad, Gujarat, Deccan and S. M. Country of Bombay Presidency, Bellary, foot of Anamalais.

*2. *Telosma minor* (Andr.) Craib in Kew Bull. (1911) 418; Gamble Fl. Madras 844.—*Pergularia minor* Andr. Bot. Rep. t. 184; Hook. f. F.B.I. iv, 38; Cke. ii, 165.—*P. odoratissima* Wight Contrib. 43; Ic. t. 414.—*Asclepias odoratissima* Roxb. Hort. Beng. (1814) 20.

Distribution: A native of the Himalaya. Largely grown in gardens. Siam, Indo-China, China, Ava.

19. MARSDENIA R. Br. (Cke. ii, 165).

Species 100.—Tropical and subtropical.

Cooke l.c. has followed N. E. Brown (Dyer Fl. Trop. Afr. iv, 417) in combining the genus *Dregea* E. Mey. with *Marsdenia*. Haines did the same in his 'Central Provinces' List' but again separated *Dregea* in his 'Botany of Bihar and Orissa', because he found the two genera very distinct in his area.

We follow Cooke and retain 2 of his 3 species: *M. tenacissima* and *M. volubilis*. But his *M. lanceolata* we combine with *M. volubilis*.

See: W. Rothe, Ueber die Gattung Marsdenia R. Br. und die Stammflanze der Condurango Rinde. Engl. Bot. Jahrb. li, 354-434.

1. *Marsdenia tenacissima* Wight & Arn. in Wight Contrib. (1834) 41; Cke. ii, 165.

Distribution: E. and W. Himalaya, ascending in Kumaon to 4,500 ft., N. Oudh, Rajmahal, Chittagong, Ava, Gujarat, W. Ghats, Lower Pulneys at 3,000 ft. in Madras Presidency, Ceylon, Timor, Java.

2. *Marsdenia volubilis* T. Cooke Fl. Bomb. Pres. ii, 166; Gamble Fl. Madras 846; Craib in Kew Bull. (1911) 418.—*Dregea volubilis* Benth. ex Hook. f. F.B.I. iv (1883) 46.

Locality: Add: *Gujarat*: Talod, climbing over trees (Sedgwick).—*Konkan*: Salsette (McCann †).—*W. Ghats*: Panchgani (Hallberg †).

Distribution: Bengal, Assam, Konkan, W. Ghats, Deccan and S. M. Country of Bombay Presidency, Madras Presidency: All plains districts and in the hills up to 5,000 ft., in dry regions, common; Malay Peninsula, Ceylon, Java.

a. *Var. Lacuna* Hook. f. F.B.I. iv, 47.—*Hoya Lacuna* Ham. in Wall. Cat. 8169; Wight & Arn. in Wight Contrib. (1834) 39; Decne. in Jacq. Voy. Bot. 108, t. 114; Decne. in DC. Prodr. viii, 639; Talbot For. Fl. Bomb. ii (1911) 256,

Pubescence hoary or mealy.

Locality: More common than next variety.

b. **Var. angustifolia** Hook. f. F.B.I. iv, 47; Talbot For. Fl. Bomb. ii (1911) 256, f. 419.—*Marsdenia lanceolata* T. Cooke, Fl. Bomb. Pres. ii, 167.

A suberect velvety form.

Locality: Common near Poona and generally throughout the Deccan (Talbot).

20. COSMOSTIGMA Wight (Cke. ii, 167).

Species 1.—Indo-Malaya.

1. **Cosmostigma racemosum** Wight Contrib. (1834) 42; Hook. f. F.B.I. iv, 46; Cke. ii, 167.

Locality: *Konkan*: Salsette (Blatter !).—*N. Kanara* (Talbot).

Distribution: Sylhet, Chittagong, Konkan, N. Kanara, Deccan of the Ceded Districts of Madras Presidency, Carnatic, Kollimalai hills of Trichinopoly, W. Ghats, Nilgiris, coast of S. Travancore, Ceylon, Java.

21. HETEROSTEMMA Wight & Arn.

Species 25.—Indo-Malaya.

1. **Heterostemma Dalzellii** Hook. f. F.B.I. iv (1883) 48; Cke. ii, 168.

Locality: A very rare species. *Konkan*: Vengurla and Malvan.—*Deccan*: Poona.

Distribution: Endemic.

22. HOYA R. Br. (Cke. ii, 169).

Species 100.—Indo-Malaya, Australia.

We retain the 4 species given by Cooke.

1. **Hoya retusa** Dalzell in Kew Journ. Bot. iv (1852) 294; Cke. ii, 169.

Distribution: In the rain forests of the Konkan and N. Kanara Ghats, common near Yellapur, S. Kanara (not endemic in Bombay).

2. **Hoya Wightii** Hook. f. F.B.I. iv (1883) 59; Cke. ii, 169.

Locality: Add: *W. Ghats*: Khandala, very common (McCann !).

Distribution: Bombay Presidency: Deccan Peninsula from the Bombay Ghats to N. Kanara, on trees throughout the Konkan and N. Kanara, very common on the Supa Ghats, mostly in rain forests. Madras Presidency: W. Ghats, hills of Coimbatore, Nilgiris, Anamalais and hills of Tinnevely, at 4,000-6,000 ft.

3. **Hoya ovalifolia** Wight & Arn. in Wight Contrib. (1834) 37; Cke. ii, 120.

Distribution: N. Kanara: On the Ghats near Yellapur, common in rain forests (Talbot); Madras Presidency: W. Ghats, from S. Kanara southwards, not common.

Note: According to Talbot it 'differs from *H. Wightii* by the shortly petioled, fasciated and smaller ovate leaves with flat margins, smaller flowers and a large distinct corona'.

4. **Hoya pendula** Wight Ic. t. 474 (*non* Wight & Arn. in Wight Contrib.); Cke. ii, 170; Haines Bot. Bih. & Or. 561.

Distribution: Bombay Presidency: W. Ghats, Konkan (hills of Colaba Dist.); Madras Presidency: N. Circars, Nilgiris; Bihar.

Note: *Hoya carrosa* R. Br. in Mem. Wern. Soc. 1 (1811) 27, a native of Queensland, and *Hoya Griffithii* Hook. f. F.B.I. iv (1883) 51, indigenous in the Khasia mountains are cultivated in the gardens of the Presidency.

23. OIANTHUS Benth. (Cke. ii, 171).

Species 4.—India.

Cooke has 2 species: *O. urceolatus* and *O. disciflorus*. We omit the latter, as there are doubts about its identity as well as its locality. But we add *O. deccanensis* Talbot.

- | | |
|---|----------------------------|
| 1. Corolla urceolate; corona lobes 3-toothed at the apex | 1. <i>O. urceolatus</i> . |
| 2. Corolla tubular or ovoid-urceolate; corona lobes entire, rounded | 2. <i>O. deccanensis</i> . |



Flowers of *Hoya Wightii* Hook. f.

Photo by the late F. Hallberg.



Flowers and fruit of *Ceropegia polyantha* Blatt. & McC.

Photo by C. McCann.

1. **Oianthus urceolatus** Benth. in Hook. Ic. Pl. t. 1191; Cke. ii, 171.

Locality: Konkan: Rewadunda (*ex* Talbot).—*Deccan*: Poona (Woodrow).—*S. M. Country*: Hills near Belgaum (*ex* Talbot).—A very rare species. Endemic.

2. **Oianthus deccanensis** Talbot For. Fl. Bomb. Pres. ii (1911) 260.

Description: A twining shrub; branchlets terete, yellowish pubescent. Leaves ovate or lanceolate, 5-10 by 1.3-5 cm., acute or acuminate at the apex, rounded or cordate at the base, thinly coriaceous, scabrous above when young, glabrescent when old, pale and very sparsely pubescent particularly on the nerves beneath; petioles about 6 mm. long, sparsely pubescent. Cymes few-flowered usually sessile, interpetiolar; pedicels 2.5-5 mm. long, pubescent. Calyx divided to near the base; sepals 2.5 mm. long, oblong, obtuse with membranous margins, sparsely pubescent in the middle. Corolla thick, ovoid-urceolate or tubular, 1.3-1.6 cm. long by 3.8 mm. diam.; lobes 1.2 mm. long, triangular, valvate, with intermediate, minute teeth; corona 5-lobed; lobes broad, incurved with rounded margins.

Locality: Deccan: Ghats, 18 miles W. of Poona (Talbot).

Distribution: Endemic.

24. LEPTADENIA R. Br. (Cke. ii, 172).

Species 15.—Tropical Africa, Asia.

We retain the 2 species given by Cooke except that we substitute *L. pyrotechnica* for *L. spartium*.

1. **Leptadenia reticulata** Wight & Arn. in Wight Contrib. (1834) 47; Wight Ic. 350; Hook. f. F.B.I. iv, 63; Cke. ii, 172.—*Cynanchum reticulatum* Retz. Obs. ii (1781) 15.—*Leptadenia imberbe* Wight Contrib. 48.

Locality: Add: *Cutch*: Rare (Blatter !).—*Gujarat*: Abundant (Sedgwick !); Surat (*ex* Talbot).

Distribution: Punjab, Burma, Bombay Presidency, Madras Presidency: N. Circars, Deccan, Carnatic, westwards to the E. slopes of the Ghats, up to about 3,000 ft., chiefly in hedges, Ceylon, Ava.

2. **Leptadenia pyrotechnica** (Forsk.) Decne. in Ann. Sc. Nat. (1838) 269; Boiss. Fl. Or. iv, 63.—*Cynanchum pyrotechnicum* Forsk. Fl. Aeg.—Arab. (1775) 53; Del. Fl. d'Ég. 54, t. 20, f. 30.—*Sarcostemma pyrotechnicum* Roem. & Schult. Syst. vi, 116.—*Microloma pyrotechnicum* Spreng. Syst. i, 855.—*Leptadenia Spartium* Wight Contrib. (1834) 48; Hook. f. F.B.I. iv, 64; Cke. ii, 173.—*L. Jacquemontiana et gracilis* Decne. in DC. Prodr. viii (1844) 641.

Description: Cke. ii, 173 (under *L. Spartium*).

Locality: *Sind*: Larkana (Sabnis B468 !); Sehwan, Kalar soil (Sabnis B24 !), river-banks (Sabnis B582 !), sand dunes (Sabnis B667 !); Laki hill (Sabnis 83 !); Sukkur, Kalar soil (Sabnis B559 !); Khairpur, Mirva canal banks (Sabnis B268 !); Nawabshah, Pad Idan (Sabnis B567 !); Hyderabad, Ganja Hill (Sabnis B991 !); Indus banks near Kotri (Sabnis B396 !); Thar and Parkar, Nasarpur (Sabnis B1124 !); Mirpurkhas (Sabnis B1054 !); Umar-kot, sand dunes (Sabnis B1011 ! B1077 !); Mirpur Sakro (Blatter & McCann D46 !); Bughar River (Blatter & McCann D45 !); Gharo (Blatter & McCann !).—*Cutch*: Very common (Blatter !).—*Kathiawar*: Abundant (Blatter !); Perim Island (Blatter !); occasional near Ahmedabad, locally common in sand and in other places (Sedgwick !); Palanpur (McCann !).

Distribution: Punjab, W. Rajputana, Waziristan, Baluchistan, Sind to Gujarat, Arabia, Egypt, tropical Africa.

25. ORTHANTHERA Wight (not in Cke.).

An erect virgate leafless shrub. Flowers small, crowded in dense peduncled woolly cymes. Calyx-lobes lanceolate, eglandular. Corolla salver-shaped; tube ovoid, equalling the lanceolate valvate lobes. Corona of 5 small erect scales inserted in the sinuses of the corolla-lobes, sometimes with an inconspicuous fleshy ring below the anthers. Staminal column ovoid, anther-tips without appendages, pollen-masses globose, stipitate, erect. Stigma included, flat, 5-gonal. Follicles elongate, cylindrical, opening out flat after dehiscence. Seeds comose.

Species 4.—Africa, India.

1. *Orthanthera viminea* Wight & Arn. in Wight Contrib. (1834) 48; Royle III. 274, t. 66, f. 1; Decne. Jacq. Bot. Voy. 109, t. 115; Hook. f. F.B.I. iv, 64; Duthie Fl. Upper Gang. Pl. ii, 65.

Description: A small erect leafless shrub with stiff glabrous branches about as thick as a crow's quill. Flowers dull brown, arranged in compact woolly cymes; peduncles 0.6-2.5 cm. long, pedicles very short. Sepals linear-lanceolate, nearly as long as the corolla. Corolla salver-shaped, 4 mm. long, villous outside, tube ovoid; lobes erect, oblong, as long as the tube, keeled and glabrous within. Follicles solitary, erect, 10-15 cm. long, linear, compressed; pericarp thin, brown within. Seeds 4 mm. long, coma 13 mm. long.

Locality: Sind (ex Duthie).

Distribution: Upper Gangetic Plain, Himalaya up to 2,500 ft. from Kumaon to Peshawar, Punjab, Sind, Rajputana.

26. CEROPEGIA Linn. (Cke. ii, 174).

Species 125.—Africa, Asia, Australia.

Cooke has 8 species. We add 4 more.

I. Stem erect

- | | | |
|--|-----|-------------------------------|
| 1. Leaves linear, less than 12 mm. wide | ... | 1. <i>C. attenuata</i> . |
| 2. Leaves not linear | ... | |
| a. Leaves acute at the base, glabrous | ... | 2. <i>C. Lawii</i> . |
| b. Leaves subcordate at base; glabrous-hairy above | ... | 3. <i>C. panchganiensis</i> . |

II. Stems twining

- | | | |
|--|-----|----------------------------|
| 1. Calyx-segments shorter than the corolla | | |
| a. Leaves fleshy | | |
| † Leaves small, less than 12 mm. long | ... | |
| or o | ... | 4. <i>C. juncea</i> . |
| †† Leaves more than 12 mm. long, never wanting | ... | 5. <i>C. bulbosa</i> . |
| b. Leaves membranous | | |
| † Corolla-lobes $\frac{1}{2}$ as long as the tube | | |
| § Leaves and peduncles glabrous; corolla-lobes contracted into a narrow beak in bud | ... | 6. <i>C. tuberosa</i> . |
| §§ Leaves and peduncles pubescent or hispid; corolla-lobes forming a clavate head in bud | | |
| * Inner corona-lobes hooked | ... | 7. <i>C. hirsuta</i> . |
| ** Inner corona-lobes straight | | |
| † Peduncles 4-8-flowered | ... | 8. <i>C. oculata</i> . |
| †† Peduncles multi-flowered (up to 30) | ... | 9. <i>C. polyantha</i> . |
| ††† Corolla-lobes as long or nearly as long as the tube | ... | 10. <i>C. Stocksii</i> . |
| †††† Corolla-lobes about $\frac{1}{3}$ the tube | ... | 11. <i>C. hispida</i> . |
| 2. Calyx-segments always much longer than corolla | ... | 12. <i>C. fantastica</i> . |

1. *Ceropegia attenuata* Hook. Ic. Pl. ix (1852) t. 867; Hook. f. F.B.I. iv, 67; Cke. ii, 175.

Locality: Konkan: Near Vengurla (Ritchie); Malvan (Dalzell); Salsette, Kanari Caves (Blatter !); Karanja Island (Blatter !).—Deccan: Junnar (Woodrow).

Distribution: Endemic.

2. *Ceropegia Lawii* Hook. f. F.B.I. iv (1883) 67; Cke. ii, 175.

Distribution: Endemic.

3. *Ceropegia panchganiensis* Blatter & McCann, *nov. sp.*

Asclepiadaceae. Similis C. Lawii Hook. f. a qua tamen differt foliis basi subcordatis nunquam acutis supra et marginibus bulboso-hirsutis, pedunculis 4-5-floris, pedicellis 8-15 mm. longis, corolla basi multum inflata.

Description: A coarse plant, up to 45 cm. high; root a tuber. Stem stout, hard, succulent, slightly thickened at the nodes, pale green, upper part densely pubescent, hairs with tiny bulbous bases which alone remain in the lower part of the stem and which make the stem rough. Leaves 3 in a whorl, or opposite, the lowest ovate-mucronate, the upper ovate-oblong or ovate-lanceolate, acuminate, up to 9 cm. by 5 cm., base subcordate, never acute, bulbous-hairy above and on margin, glabrous and subglabrous below, nerves and veins deeply depressed above, very prominent below; petioles up to 25 mm. long, stout, deeply channelled above, scaberulous. Flowers in pedunculate cymes; peduncles 4-5-flowered, arising from between the petioles (not more than 2 peduncles between 2 leaves, sometimes the third leaf is replaced by a peduncle) stout, strict, hairy; pedicels up to 8-15 mm. long, very hairy. Bracts linear-subulate, up to 3 mm. long, bright green, glabrous. Calyx divided to the base; sepals 3-4 mm. long, linear-lanceolate-acuminate, scabrous outside in lower half. Corolla 3-4 cm. long, tube striate, greenish white or very pale lilac outside, turning purple or dark blue on drying, much inflated at base, inflated part 8-10 by 5-6 mm., distinctly ribbed; lobes obovate-acute, incurved, forming a 5-lobed head, 5-6 mm. long, 7-9 mm. diam., flattened on top, tips united, ventral side of lobes olive green. Corolla inside: inflated part very dark purple, mottled light brown near upper constriction, narrow tube dark purple below, getting brownish about the middle, then turning bluish green just below the lobes; lobes olive green. Outer corona: cup-shaped, dark purple, 5-lobed, lobes long, bicuspidate, ciliate with long brittle stiff hairs. Inner corona-lobes erect, fleshy, yellow, with a few long stiff hairs, cylindrical, slightly thinner towards apex, 2 mm. long. Anthers oblong, yellow. Fruit not seen.

Locality: *W. Ghats:* Panchgani, compound of Bicklan, in high grass (Blatter 200 type).

Flowers: 24-7-26.

4. *Ceropegia juncea* Roxb. *Corom. Pl. i* (1795) 12, t. 10; Hook. f. *F.B.I. iv*, 68; Cke. ii, 175.

Distribution: S. M. Country, N. Kanara, N. Circars, Carnatic, S. Travancore, in dry forests.

5. *Ceropegia bulbosa* Roxb. *Corom. Pl. i* (1795) 11, t. 7; Hook. f. *F.B.I. iv*, 67; Cke. ii, 176.

Distribution: Punjab plains, Upper Gangetic plain, Sind (Agharkar), Gujarat (Sedgwick), Konkan, S. M. Country, Deccan, N. Kanara, S. Kanara and Malabar, Carnatic.

6. *Ceropegia tuberosa* Roxb. *Corom. Pl. i* (1795) 12, t. 9; Hook. f. *F.B.I. iv*, 70; Cke. ii, 176.

Distribution: Bombay Presidency: Konkan, Deccan, S. M. Country. Madras Presidency: N. Circars, Deccan and Carnatic to the lower slopes of the Ghats, up to about 3,000 ft., common.

7. *Ceropegia hirsuta* Wight & Arn. in Wight *Contrib.* (1834) 30; Hook. f. *F.B.I. iv*, 71; Cke. ii, 177.

Locality: Add: *W. Ghats:* Khandala (Blatter !); Panchgani, in grass and amongst rocks (McCann !).

Distribution: Mt. Abu, Konkan, Deccan, *W. Ghats*, Madras Presidency: N. Circars in Ganjam, Rampa hills of Godavari, *W. Ghats*, Nilgiri hills, Anamalais.

8. *Ceropegia oculata* Hook. *Bot. Mag.* (1844) t. 4093; Hook. f. *F.B.I. iv*, 72; Cke. ii, 177.

Distribution: Konkan.—Endemic in the Presidency.

9. *Ceropegia polyantha* Blatter & McCann in *Journ. Bomb. Nat. Hist. Soc.* xxxiv (1931) 926, with plate.

Description l.c.—When we described *C. polyantha* we had not seen the fruit. We found it on the last of October 1932 in the same locality. Here is the description: Follicles erect, parallel or divergent at a right angle, cylindrical, tapering towards a blunt apex, about 10 cm. long, by 0.5 cm. where thickest, glabrous, smooth, green or greenish purple speckled with purple, tips deep purple. Seeds ovate-oblong, flattened with a broad submembranous margin, 6.5 by 4 mm., coma about 3.5 cm. long.

Locality: *W. Ghats:* Lingmala hills near Mahableshwar (McCann &

Fernandez 3470 A, B, C, D ! type, 3441 ! 3442 ! 3471-78 !); Khandala, on top of 'Sausages' (Blatter ! Herb. St. X. C.).

Flowers: Sept.

10. *Ceropegia Stocksii* Hook. f. F.B.I. iv (1883) 74; Cke. ii, 178; Gamble Fl. Madras 859.

Description: Cke. l.c.—“A rather large climber with corollas green shaded with purple spots on the funnel part of the tube; follicles very slender, nearly 1 ft. long.” (Gamble).

Distribution: Bombay Konkan; Madras Presidency: W. Ghats, Anamalais and hills of Travancore at 2,000-4,000 ft., in moist forests.

11. *Ceropegia hispida* Blatter & McCann in Journ. Bomb. Nat. Hist. Soc. xxxv (1931) 409, with plate.

Locality: W. Ghats: Panchgani, near Godauli (McCann & Fernandez 3566 !).

Flowers: October.

12. *Ceropegia fantastica* Sedgwick in Journ. Ind. Bot. ii (1921) 124.

Locality: N. Kanara: Sulgeri, 500 ft., rainfall 200 in. (T.R.D. Bell No. 4252 ! Herb. Sedgwick & Bell).

Flowers: Aug.

Sedgwick calls it ‘a curious species, at once recognisable by the enormously long and fine calyx segments, bracts and bracteoles. The corolla is in general shape typical of the genus, the segments of the swollen apical portion meeting at their tips. The corona was quite indistinguishable in soaked-out flowers.’

27. *FREREA* Dalz. (Cke. ii, 178).

Species 1.—Western Peninsula of India.

1. *Frerea indica* Dalz. in Journ. Linn. Soc. viii (1865) 10, t. 3; Cke. ii, 178. Distribution: Deccan.—Endemic in the Presidency.

28. *CARALLUMA* R. Br. (Cke. ii, 179).

Species 65.—Mediterranean to E. India.

See: F. H. Gravelly & P. V. Mayuranatham, The Indian Species of the Genus *Caralluma*, in Bull. Madras Government Museum, new series, Nat. Hist. Sect. iv (1930) pt. 1.

Cooke has 2 species: *C. edulis* Benth. and *C. fimbriata* Wall. We follow Gravelly etc. in making *C. fimbriata* a variety of *C. adscendens*. Finally we add *Boucerosia truncato-coronata* Sedgwick under the name of *C. truncato-coronata*.

I. Flowers arising in or more usually close beside the axils of the rudimentary and evanescent leaves

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| 1. Outer lobes of corona distinct, 10 in number, their filamentous apices widely separated throughout | ... | ... | 1. <i>C. edulis</i> . |
| 2. Adjacent pairs of outer lobes of corona fused to form plates, from the distal end of each of which arises a pair of long terminal filaments, almost in contact with one another at base | ... | ... | 2. <i>C. adscendens</i> . |
| a. Angles of stem, at least towards base, rounded; stems small and of about equal thickness throughout | ... | ... | <i>var. fimbriata</i> . |
| b. Angles of stem, at least towards base, acute; stems larger, more or less strongly attenuate distally | ... | ... | <i>var. attenuata</i> . |

II. Flowers terminal, exactly umbellate

3. *C. truncato-coronata*.

1. *Caralluma edulis* Benth. Gen. Pl. ii (1876) 782; Cke. ii, 179; Gravelly & Mayur. 8—*Boucerosia edulis* Edgew. in Journ. Linn. Soc. vi (1862) 205, t. 1.—*Boucerosia Stocksiana* Boiss. Fl. Or. iv (1879) 64.

Description: Cke. l.c.—Cooke has not seen the follicles. Edgeworth describes them like this: Follicles erect, terete, quite smooth and glabrous, very attenuate. Seeds marginate, winged, long comose.

Locality: Sind: Jamadar ka Landa (Stocks 533); Mulir, near Karachi (Woodrow).

Distribution: Punjab, Sind, Baluchistan.

2. ***Caralluma adscendens*** R. Br. in Mem. Wern. Soc. i, 25.—*Stapelia adscendens* Roxb. Corom. Pl. i (1795) 28, t. 30.—*Caralluma fimbriata* Wall. Pl. As. Rar. i (1830) 7, t. 8; Loddiges (1832) no. 1863, fig. Cke. ii, 179.—*C. attenuata* Wight Ic. (1850) t. 1268; Ill. t. 155b, fig. B.

Distribution: Probably occurs in suitable situations all over the Indian Peninsula south and inclusive of Poona in the west and Ganjam in the east (*ex* Gravely etc.).

Var. *fimbriata* Gravely & Mayur. 13.

Stems small, not definitely attenuate, sometimes reddish distally, their angles rounded; flowers rather small, more or less pendulous, hairy.

Locality: W. Ghats: Pasarni Ghat, about 3,500 ft. (Blatter & Fernandez !).—*Deccan*: Nira River, 2,500 ft., rocky banks (Fernandez !).

Distribution: Kambakkam, Nagari, Nagalapuram, Chingleput, Ceylon, Burma.

Var. *attenuata* Gravely & Mayur. 13.

Stems, except when young and undergoing rapid growth, strongly attenuate and usually much branched distally, usually with reddish streaks, their angles always rounded; total height often well over 60 cm., of which only the lower part (less than half this height) is stout; flowers hairy, less definitely pendulous than the preceding variety and often opening more widely when they are about 15 mm. across, their markings usually dark purple in colour.

Locality: *Deccan*: Bapudi, 3 miles north of Poona (Ganpat).

Cooke put this plant under *fimbriata*, but Gravely etc. says that this record 'almost certainly' refers to *attenuata*.

Distribution: See Gravely etc. 13.—The most widely distributed of all the varieties of *C. adscendens*.

3. ***Caralluma truncato-coronata*** Gravely & Mayur. 21.—*Bouccrosia truncato-coronata* Sedgw. in Journ. Ind. Bot. ii (1921) 125.

Sedgwick calls it an inconspicuous plant with elegant flowers and adds that it differs from the other Indian species of *Bouccrosia* in having the bifid corona lobes reduced to a broadly truncate top with minute horns or teeth at each end.

(To be continued.)